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The Examiner has rejected claims 1 – 5 of the present application under 35 USC 102(b) as being anticipated by O'Laughlin (US 3 074 390), he has rejected claim 6 under 35 USC 103(a) as being unpatentable over O'Laughlin in view of Bauerle et al., US 5 666 932, he has rejected claim 7 under 35 USC 103(a) as being unpatentable over O'Laughlin in view of Israel et al. (20030178002A1) and he has rejected claim 8 under 35 USC 103(a) as being unpatentable over O'Laughlin in view of Wall et al. (US 6,244,256).

O'Laughlin (US 3 074 390) discloses a fuel economizer for an internal combustion engine with a container 5 including an electrolyte 10 and electrodes 11 connected to an electric power source 15 for the decomposition of the electrolyte into hydrogen and oxygen. Recirculated exhaust gas is conducted through the container 5 and is enriched therein by the hydrogen and oxygen. This is intended to improve the power output and efficiency of the engine and to reduce the fuel consumption and decrease toxic emissions, as clean burning hydrogen and oxygen is added to the recirculated exhaust gas.

Bauerle et al. (US 5 666 932) discloses an EGR valve with an inlet and an outlet opening which are both arranged in the same plane.

Israel et al. (US 20030178002A1) discloses an apparatus and a method to operate an engine exhaust brake together with an exhaust gas recirculation system which includes an exhaust gas cooler 44. A charge air cooler 52 is arranged in a parallel circuit, both circuits leading to the engine intake manifold.

Wall et al. (US 6 244 256) discloses a high-temperature cooling loop for cooled exhaust gas recirculation for internal combustion engines with an exhaust gas recirculation circuit that includes possibly two coolers, each provided with a separate cooling circuit.

The present invention resides in an exhaust gas recirculation system 2 for a motor vehicle including an exhaust gas recirculation line 4 extending between an exhaust gas manifold 22 and an air inlet system 3 of the internal combustion engine wherein the exhaust gas recirculation line includes an exhaust gas recirculation valve 4.3, at least one first exhaust gas cooler 4.3 arranged in the exhaust gas recirculation line upstream of the exhaust gas recirculation valve 4.3 and at least one second exhaust gas cooler 4, 2 provided in the exhaust gas recirculation line 4 downstream of the exhaust recirculation valve 4.3.

With the valve 4.3 arranged downstream of the first exhaust gas cooler 4.1, the valve 4.3 is not subjected to the extremely hot exhaust gases as they leave the internal combustion engine so that its life is substantially increased. Furthermore, during engine braking operation when the valve 4.3 is closed only the upstream exhaust gas cooler 4.1 is exposed to the high exhaust gas back pressure. The downstream exhaust gas cooler 4.2 is not subjected to the exhaust gas back pressure generated by the closed valve 4.3 and therefore may be constructed employing a lower strength, lighter design. Only the first exhaust gas cooler 4.1 needs to be a pressure and temperature resistant cooler. The second cooler requires only smaller wall thicknesses providing not only for a less expensive structure but also for substantially improved heat transfer.

Such an arrangement is certainly not disclosed by US 3 074 390 as alleged by the Examiner. The container 5 of US 3 074 390 is not a heat exchanger as alleged by the Examiner, it is rather an electrolyte container filled with an electrolyte which, during engine operation, is dissociated by a current flow established between the electrodes 11 so as to generate hydrogen and oxygen to be added to the exhaust gas recirculated through the container 6 to the engine intake manifold.

The concept of the present invention as presented above has nothing in common with the concept with which US 3 074 390 is concerned and is certainly not disclosed, nor is it in any way suggested, by US 3 074 390.

Reconsideration of the Examiner's rejection of claim 1 under 35 USC 102 is therefore respectfully requested.

Claims 2 and 3 of the present application define that the first exhaust gas cooler 4.1 is a pressure resistant cooler and the second exhaust gas cooler 4.2 is a low-pressure cooler – which, again, is not disclosed in, nor obvious from, any of the cited references.

Claims 4 and 5 define that at least one further high pressure exhaust gas cooler is provided upstream of the exhaust gas recirculation valve and at least one further low pressure exhaust gas cooler is provided downstream of the exhaust gas recirculation valve. Again this feature is not disclosed in any of the cited references, and again reconsideration of the rejection of these claims under 35 USC 102 is respectfully requested.

Claim 6 relates to a feature considered to be convenient in connection with the arrangement of the upstream and downstream exhaust gas recirculation coolers as exhaust gas

flow reversal from the upstream to the downstream cooler can be achieved with the arrangement claimed in claim 6 in an efficient, inexpensive manner as the inlet and the outlet openings of the exhaust gas recirculation valve are arranged on the same lateral surface of the exhaust gas recirculation valve. Claim 6 is furthermore dependent on claim 1 and, consequently, includes all the features of claim 1 so that it should be patentable already for that reason.

Claim 7 defines that the charge air cooler 3.3 and at least one of the first and second exhaust gas coolers 4.1, 4.2 have a common cooling circuit 3.5 – that is, for the coolant cooling the exhaust gas -. And claim 8 defines that the charge air cooler 3.3, the first exhaust gas cooler 4.1 and the second exhaust gas cooler 4.2 all have separate cooling circuits.

These are features selectable based on certain conditions and constraints. They are selectable however only in connection with the design as defined in claim 1 as all these claims are dependent on claim 1 and, again, include therefore all the features of claim 1 and therefore ought to be considered to be patentable together with claim 1.

Reconsideration also of claims 6 – 8 is respectfully requested and allowance of claims 1 – 8 is solicited.

Respectfully submitted,



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